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REMARKS

Claims 1 and 67 are amended. Claim 81 is cancelled. New claims 82 and 83 are added. Claims 1-13, 67-80 and 82-83 are pending in the application.

In response to the Examiner's request for restriction, applicant hereby affirms the February 13, 2002 provisional election to prosecute the invention of group I (claims 1-13 and 67-81). Applicant acknowledges the Examiner's withdrawal from further consideration of claims 14-66 as being drawn to a non-elected invention.

Claims 11, 12 and 68 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Examiner states that "the claims seem to suggest that nearly any material may be used" and states that claims 1, 12 and 68 be rewritten in "proper Markush claim language" to overcome the rejection. The Examiner is reminded by direction to MPEP § 2173.05(h), that Markush language is one acceptable form of alternative expression and not the only acceptable form of alternative expression.

Claim 11 recites the alternative expression "comprising one or more of" which is followed by a list of specific elements. MPEP § 2173.05(h) states that if materials recited constitute a proper Markush group, they may be recited in the conventional (Markush) manner or in other alternative language. The standard set forth in the MPEP is that "alternative expressions are permitted if they present no uncertainty or ambiguity with respect to the question of scope or clarity of the claim". The use of the alternative expression "one or more of" recited in claim 11, which is followed by a specific listing of elements does not render the claim unclear and is permissible.

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Claims 12 and 68 each recite the alternative expression "comprising one or more of" followed by a list of elements. As discussed above, the use of this alternative expression does not render the claims unclear. Accordingly, applicant respectfully requests withdrawal of the § 112 rejection of claims 11, 12 and 68 in the Examiner's next action.

Claims 1-4, 7-13, 67-69, 71-74 and 77-81 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Dunlop et al., U.S. Patent No. 5,590,389. The Examiner is reminded by direction to MPEP § 2131 that anticipation requires each and every element of the claim to be disclosed in a single prior art reference. Claims 1-4, 7-13, 67-69, 71-74 and 77-81 are allowable over Dunlop for at least the reason that Dunlop fails to disclose each and every limitation in any of those claims.

As amended, claim 1 recites a physical vapor deposition target comprising a material formed by a process including casting and having a predominant <220> crystallographic texture across a sputtering surface. The amendment to claim 1 is supported by the specification at, for example, page 10, line 26 through page 11, line 19. Dunlop discloses using liquid dynamic compaction (LDC) to produce a preform and subjecting the preform to equal channel angular extrusion to form a target that can comprise <220> texture (col 6, ln 66 through col 7, ln 12 and col 8, lns 26-67). Dunlop does not disclose or suggest the claim 1 recited physical vapor deposition target comprising a material formed by a process including casting and having a predominate <220> crystallographic texture across a sputtering surface. Accordingly, claim 1 is not anticipated by Dunlop and is allowable over this reference.

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Dependent claims 3-4 and 7-13 are allowable over Dunlop for at least the reason that they depend from allowable base claim 1.

As amended, independent claim 67 recites a physical vapor deposition target wherein any precipitates present in the target have a maximum dimension of 0.5 micron. The amendment to claim 67 incorporates the subject matter of claim 81 and therefore does not add "new matter" to the application. The Examiner states at page 5, lines 1-3 of the present action that the recited feature of precipitates of less than 0.5 micron is anticipated by Dunlop because Dunlop discloses precipitate regions that measure less than about 1 micron. However, as set forth in the MPEP at § 2131.03, anticipation of a claim requires the reference to disclose the claimed subject matter with "sufficient specificity to constitute anticipation under the statute". Where no specific examples falling within the claimed range are disclosed in the reference, anticipation must be determined on a case to case basis. Section 2131.03 further states that if the reference discloses a broad range and the claims are directed to a narrower range, and there is evidence of unexpected results, "it may be reasonable to conclude that the narrow range is not disclosed with "sufficient specificity" to constitute anticipation.

The range of precipitate sizes of less than about 1 micron as disclosed in Dunlop is broad relative to the claim 67 recited maximum dimension of 0.5 micron. The Dunlop disclosure specifically states that the LCD process can produce a workpiece that exhibits "few precipitate regions that measure more than 1 micron" (col 6, lns 19-21), while claims recite a workpiece wherein "substantially all precipitate regions . . . measure less than about 1 micron" (claims 6 and 12). Dunlop does not disclose any examples of materials

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wherein any precipitates present have a maximum dimension of 0.5 micron as recited in applicant's claim 67.

The claim 67 recited precipitate size confers improvements on materials relative to the cited art. As discussed in applicant's disclosure at page 1, lines 13 through page 2, line 2; and page 11, lines 16-19, it is advantageous that any precipitates be fine and uniform to enhance stability of microstructures in a material and enhance sputtering target performance (i.e. ability to maintain uniform film thickness during film formation). Dunlop fails to provide any specific example of the claim 67 recited size range and the recited range confers improvements over the Dunlop disclosure. Accordingly, the Dunlop disclosure does not anticipate the claim 67 recited physical vapor deposition target wherein any precipitates present have a maximum dimension of 0.5 micron, and claim 67 is allowable.

Dependent claim 81 is cancelled. Dependent claims 68-69, 71-74 and 77-80 are allowable over Dunlop for at least the reason that they depend from allowable base claim 67.

Claims 5, 6, 75 and 76 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Dunlop. The Examiner is reminded by direction to MPFP § 2143 that a proper obviousness rejection has the following three requirements: 1) there must be some suggestion or motivation to modify or combine references teachings; 2) there must be a reasonable expectation of success; and 3) the combined references must teach or suggest all of the claim limitations. Claims 5, 6, 75 and 76 are allowable over Dunlop for at least the reasons that Dunlop fails to disclose or suggest each and every limitation in

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any of those claims and there was no reasonable expectation of success based upon the Dunlop disclosure.

As discussed above with respect to independent claim 1, Dunlop does not disclose the recited physical vapor deposition target comprising a material formed by a process including casting and having a predominate <220> crystallographic texture across a sputtering surface. Furthermore, Dunlop does not suggest the recited target comprising a material formed by a process including casting and having a predominate <220> crystallographic texture across a sputtering surface. Independent claim 1 is therefore not rendered obvious by Dunlop.

Dependent claims 5 and 6 are non-obvious over Dunlop for at least the reason that they depend from allowable base claim 1. Additionally, Dunlop does not disclose or suggest the claim 5 and 6 recited ratios of <220> crystallographic orientation to all other orientations. The Examiner states at page 6, section 11 of the present action that it would have been obvious to one of ordinary skill to create a sputtering target with a highest ratio of <220> crystallographic texture possible to provide the best sputtered film uniformity. Dunlop discloses at col 8, lns 64-67 that strong <220> texture provides good film uniformity. However, as noted by the Examiner at page 5 of the present action, Dunlop fails to disclose the ratios recited in claims 5 or 6. Even if Dunlop were to suggest that it was desirable to have increased ratio of <220> crystallographic textures in a sputtering target above the ratios disclosed, there is no reasonable expectation of success for achieving the claim 5 and claim 6 recited ratios based upon the Dunlop disclosure. The Examiner's rejection appears to be based on the impermissible "obvious to try" standard

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and is therefore improper. Accordingly, applicant respectfully requests withdrawal of the § 103 rejection of claims 5 and 6 in the Examiner's next action.

As discussed above with respect to independent claim 76, Dunlop fails to disclose a physical vapor deposition target having a predominate <220> crystallographic texture across a sputtering surface wherein any precipitates present in the target have a maximum dimension of 0.5 micron. Furthermore, Dunlop does not suggest the recited target having a predominate <220> crystallographic texture wherein any precipitates have a maximum dimension of 0.5 micron. Accordingly, independent claim 76 is not rendered obvious by Dunlop. Additionally, claim 75 recites a ratio of <220> orientation to all other orientations of at least about 80%, and claim 76 recites a corresponding ratio of at least about 90%. Dependent claims 75 and 76 are therefore additionally allowable for reasons similar to those discussed above with respect to claims 5 and 6.

Claim 70 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Dunlop in view of Segal, U.S. Patent No. 6,238,494. As discussed above with respect to independent claim 67, Dunlop fails to disclose or suggest the recited target comprising a predominate <220> crystallographic texture across a sputtering surface wherein any precipitates present in the target have a maximum dimension of 0.5 micron. Segal discloses targets comprising fine and uniform structures and strong uniform textures (col 6, lns 44-48). Segal does not disclose or suggest the claim 67 recited physical vapor deposition target having a predominate <220> crystallographic texture across a sputtering surface wherein any precipitates present in the target have a maximum dimension of 0.5 micron. As combined, Dunlop and Segal fail to disclose or suggest the recited target

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comprising a surface having a predominate <220> crystallographic texture wherein any precipitates present in the target have a maximum dimension of 0.5 micron. Accordingly, independent claim 67 is not rendered obvious by the combination of Dunlop and Segal. Dependent claim 70 is allowable over the combination of Dunlop and Segal for at least the reason that it depends from allowable base claim 67.

New claims 82 and 83 do not add "new matter" to the application since each is fully supported by the specification as originally filed. Independent claim 82 is supported by the specification at, for example, page 25, line 26 through page 26, line 14; page 23, line 25 through page 24, line 4; and the claims as originally filed. New claim 83 is supported by the specification at, for example, page 26, lines 23-24; page 10, lines 19-26; and the claims as originally filed.

For the reasons discussed above, claims 1-13 and 67-80 are allowable and claims 82-83 are believed allowable. Accordingly, applicant respectfully requests formal allowance of claims 1-13, 67-80 and 82-83 in the Examiner's next action.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE ACCOMPANYING
RESPONSE TO MARCH 21, 2002 OFFICE ACTION

In the Claims

The claims have been amended as follows. Underlines indicate insertions
and ~~strikeouts~~ indicate deletions.

1. (Amended) A physical vapor deposition target comprising a material with a face centered cubic unit cell, having a sputtering surface, and comprising:
a predominate <220> crystallographic texture across the sputtering surface; and
an average grain size across the sputtering surface of less than or equal to about 30 microns, the material being formed by a process including casting.

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67. (Amended) A physical vapor deposition target comprising a copper material with a face centered cubic unit cell, having a sputtering surface, and comprising: a predominate <220> crystallographic texture across the sputtering surface;

and

an average grain size across the sputtering surface of less than or equal to about 30 microns, wherein any precipitates present in the target have a maximum dimension of 0.5 micron.

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